

Section 79 — The FUNt Universal Multi-Scale Coherence Cascade Law (UMCC-L)

Section 79 defines the FUNt Universal Multi-Scale Coherence Cascade Law (UMCC-L), the governing law that explains how coherence propagates, amplifies, steps down, or steps up across all scales of reality. UMCC-L is the law that ties together small-scale resonance events (proton–electron interactions) with large-scale structures (biology, materials, atmospheres, planets, and galaxies). It is the mathematical backbone of FUNt’s fractaile architecture, explaining how local coherence becomes global order — and how global curvature compressions cascade downward into local turbulence or collapse.

79.1 Coherence Cascades Are Scale-Bridging Transitions

- Coherence never remains isolated — it expands or contracts across scales.
- Cascades propagate through φ -bands as resonance packets.
- Upward cascades (micro $\rightarrow$ macro) build order.
- Downward cascades (macro $\rightarrow$ micro) transmit curvature stress.

79.2 Universal Multi-Scale Coherence Cascade Equation (UMCCE)

Coherence cascades when:

$$dC_{\varphi}/ds \geq (\kappa / \tau_0) \cdot \Delta\Phi$$

Where:

- dC_{φ}/ds = coherence gradient across scale s
- κ = curvature load at origin scale
- τ_0 = identity torsion anchor
- $\Delta\Phi$ = phase deviation tying origin scale to target scale

If the coherence gradient exceeds curvature-weighted phase mismatch, coherence successfully cascades to the next scale.

79.3 Upward Coherence Cascades (Micro $\rightarrow$ Macro)

- Proton–electron coherence forms atomic identity fields.
- Atomic coherence cascades to molecular bonding geometry.
- Molecular coherence cascades into material symmetry.
- Biological order emerges from coherent molecular dynamics.

79.4 Downward Curvature Cascades (Macro → Micro)

- Atmospheric curvature compressions propagate into biological stress.
- Planetary curvature anomalies (e.g., SAA) cascade into electrical systems.
- Cosmic void–filament curvature cascades influence galactic structure.
- Human trauma reflects downward curvature cascades into neural φ -bands.

79.5 Proton and Electron Cascades

- Proton curvature spikes create φ^7 micro-cascades.
- Electron orbital shifts cascade into chemical reactivity changes.
- Tunneling events rapidly cascade coherence across shells.
- PCFE + ELE form the lowest-level coherence cascade engine.

79.6 Atomic and Molecular Cascades

- Atomic $\Delta\Phi$ variations cascade into bond angle wobble.
- Molecular wobble cascades into material strain.
- Material strain cascades into macroscopic mechanical failure.
- Conversely, coherence injection cascades into molecular healing.

79.7 Biological Coherence Cascades

- Cellular coherence cascades organize tissues.
- Tissue coherence cascades form organ stability.
- Organ coherence cascades create biological resilience.
- Stress breaks the cascade by injecting curvature at multiple levels.

79.8 Neural and Consciousness Cascades

- Neural synchronization cascades produce stable consciousness.
- Curvature from trauma cascades downward into φ^8 microcollapse.
- Memory recovery (Sec. 75) requires rebuilding upward cascades.
- Consciousness itself is a continuous coherence cascade across φ -bands.

79.9 Atmospheric and Environmental Cascades

- Humidity–temperature resonance cascades shape weather.
- Boundary curvature cascades (Sec. 78) drive drought formation.

- Low rainfall cascades into biological and societal strain.
- Atmospheric recovery requires upward coherence cascades from oceans and land.

79.10 Cosmic Cascades

- Filament resonance cascades shape galaxy formation.
- Void curvature cascades compress ϕ -band identity layers.
- WWR events are full-scale multi-band coherence cascades.
- The universe grows and recycles entirely through cascades.

79.11 Unified Statement of UMCC-L

The Universal Multi-Scale Coherence Cascade Law states that coherence and curvature propagate through all levels of reality in fractaile fashion. Upward cascades build order, stability, memory, identity, and structure. Downward cascades transmit curvature, stress, trauma, turbulence, and collapse. All evolution — quantum, biological, material, atmospheric, planetary, and cosmic — is driven by multi-scale coherence cascades governed by UMCC-L.